

**Chapter  
1****Polynomial Expressions**

Dear Family,

Has your family ever visited an amusement park? If so, take a family vote. What is your favorite ride in the amusement park and why? Do you all agree? Have you considered the science behind the rides at an amusement park?

Together, make a list of as many different types of amusement park rides as you can. Now, group the rides into categories. For example, put all the rides that spin into one category, and the rides that go up and down into another category, etc. Some of the rides may overlap categories.

Now consider how each ride works. Start with the roller coaster. Besides the initial pull up the first big hill, a roller coaster is driven by forces of nature. The coaster stores energy (known as potential energy) as it is climbing the first big hill preparing for descent on the other side. The energy of motion is known as kinetic energy. The coaster converts potential energy into kinetic energy back and forth as it progresses through the loops, hills, and valleys of the track. In return, the coaster accelerates and decelerates producing a strange sensation for the rider. The force of gravity also plays an important role in the thrill of the ride.

The designers of a roller coaster cannot just place the hills and loops wherever they want. They must rely on precise mathematical calculations to design a safe but awesome ride. So how do they do that?

- Using the Internet, research to find equations that roller-coaster designers use to determine potential energy and kinetic energy. Identify what the variables represent in each equation.
- Research the effects that hills, loops, and valleys have on the body. If you are a thrill seeker, is it better to sit in the front, middle, or back of the roller coaster?

Pick one other amusement park ride to research. Consider a free-fall ride or a pendulum-style ride. What types of sensations does the rider experience on these types of rides? Research the math behind the ride you chose. How does a designer make sure these rides are safe?

Find a website that would allow you to build your own amusement park ride to see if you can design a safe, thrill-seeking ride using the concepts you have learned. Amusement parks are filled with rides and attractions that utilize the concepts you will learn in this chapter. Enjoy the ride!

**Chapter  
1****Polynomial Expressions (continued)**

	<b>Learning Target</b>	<b>Success Criteria</b>
Chapter 1 Polynomial Expressions	Understand polynomial expressions and factoring.	<ul style="list-style-type: none"><li>• I can classify polynomials by degree and number of terms.</li><li>• I can add, subtract, and multiply polynomials.</li><li>• I can interpret polynomial expressions.</li><li>• I can factor polynomials and use factoring to solve real-life problems.</li></ul>
1.1 Adding and Subtracting Polynomials	Add and subtract polynomials.	<ul style="list-style-type: none"><li>• I can classify polynomials.</li><li>• I can add and subtract polynomials.</li><li>• I can model real-life situations using sums and differences of polynomials.</li></ul>
1.2 Multiplying Polynomials	Multiply polynomials.	<ul style="list-style-type: none"><li>• I can multiply polynomials by monomials.</li><li>• I can multiply binomials using the Distributive Property and the FOIL Method.</li><li>• I can multiply binomials and trinomials.</li></ul>
1.3 Factoring Polynomials	Factor polynomials.	<ul style="list-style-type: none"><li>• I can factor polynomials.</li><li>• I can use patterns to find products of polynomials.</li><li>• I can recognize and factor special products.</li></ul>